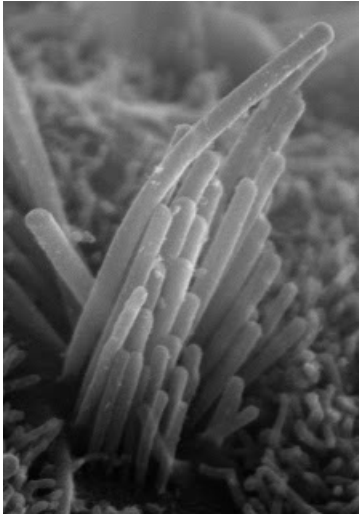


Hairs in a Dish Give Hope to Damaged Ears

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The microscopic hair cells found in the inner ear are so sensitive to vibration they can relay to the brain whether the air movement around them is from guitar licks by Eric Clapton or a piano chord from a Chopin Palinais, but too many loud Metallica concerts can damage them leading to hearing loss. Now, a team of stem cell scientists at Sanford has succeeded for the first time in growing these sensory cells from embryonic or iPS cells in a laboratory dish (shown in the image, taken in the laboratory of Stefan Heller at Stanford University), a key step in understanding how they really work and to growing new cells to replace damaged ones.

The team lead by Stanford's Stefan Heller coaxed mouse embryonic stem cells in a dish into maturing into cells that looked and acted like the animal's inner-ear hair cells. A press release from the university quoted Harvard neuroscientist David Corey, who was not connected to the study, offering hope and calling for patience:

“This gives us real hope that there might be some kind of therapy for regenerating hair cells. It could take a decade or more, but it is a possibility.”

The researchers accomplished this feat with both embryonic stem cells and stem cells created by reprogramming skin cells, so called iPS cells. They used various growth factors to first coax embryonic or iPS cells into becoming ectoderm, the embryo's outer layer, then coaxed those ectoderm cells into progenitor cells for the ear and then into the hair cells.

Heller works on two paths toward curing deafness: drug therapy to resurrect the malfunctioning hair cells and stem cell-derived cell transplants. His team's hairy dish could speed work for both. In the release he said:

“We could now test thousands of drugs in a culture dish. It is impossible to achieve such a scale in animals.”

It's exciting to see how far this research has come since 2008, when CIRM hosted a Spotlight on Deafness, with talks by clinicians, researchers, and a deaf woman eager explaining why she's hopeful for a cure.

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D.G.

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